WHAT IS CLAIMED IS:

1. An apparatus for storing a plurality of supports having a plurality of chemical compounds bound thereto at individual sites thereon, said apparatus comprising:

(a) a mechanism for diffusively introducing pressurized gas into said apparatus,

(b) an outlet element in fluid communication with said mechanism, said outlet element comprising a plurality of openings therein, and

(c) a holding chamber for said supports in fluid communication with said outlet element, said outlet element and said holding chamber being disposed such that gas flow therethrough is substantially uniform, said holding chamber comprising an opening sufficient to permit movement of said supports to and from said holding chamber and comprising a plurality of holding elements for holding said supports.

2. An apparatus according to Claim 1 comprising a flow-straightening element disposed in fluid communication between said outlet element and said holding chamber.

3. An apparatus according to Claim 1 wherein said mechanism comprises one or more gas inlets and a manifold comprising one or more compartments, each of said compartments being in fluid communication with one or more gas inlets.

4. An apparatus according to Claim 3 wherein said gas inlets are substantially perpendicular to the axis of said openings in said outlet element.

5. An apparatus according to Claim 1 wherein said holding elements for said supports are adapted to hold said supports in a substantially vertical position.

6. An apparatus for storing a plurality of supports having a plurality of biopolymers bound thereto at individual sites thereon, said apparatus comprising:

(a) a manifold comprising one or more compartments, each of said compartments being in fluid communication with at least one gas inlet for introducing pressurized gas into said apparatus, wherein said gas inlets are positioned in said manifold such that gas is introduced into said manifold in a direction that is substantially normal to the direction of gas exiting said manifold,

(b) an outlet element in fluid communication with said manifold, said outlet element comprising a plurality of openings therein, and

(c) a holding chamber for said supports in fluid communication with said outlet element, said outlet element and said holding chamber being disposed such that gas flow therethrough is substantially unidirectional, said holding chamber comprising an opening sufficient to permit movement of said supports to and from said holding chamber and comprising a plurality of holding elements for holding said supports.

7. An apparatus according to Claim 6 wherein each of said gas inlets comprises a valve.

8. An apparatus according to Claim 6 wherein said gas is introduced into said manifold at a pressure of about 60 to about 80 psi.

9. An apparatus according to Claim 6 wherein said outlet element is about 0.2 to about 2 inches thick and comprises about 10 to about 50 openings per square inch.

10. An apparatus according to Claim 6 wherein the diameter of each of said openings is about 0.03 to about 0.25 inches.

11. An apparatus according to Claim 6 wherein said outlet element is about 0.02 to about 0.2 inches thick and said apparatus comprises a flow-straightening element disposed in fluid communication between said outlet element and said chamber.

12. An apparatus according to Claim 11 wherein said flow-straightening element is a honeycomb element.

13. An apparatus according to Claim 12 wherein the ratio of length of said honeycomb element to honeycomb features is at least about 7 to 1.

14. An apparatus according to Claim 12 wherein the thickness of said honeycomb element is about 1 to about 1.5 inches.

15. An apparatus according to Claim 6 wherein said gas inlets are substantially perpendicular to the axis of said openings in said outlet element.

16. An apparatus according to Claim 1 wherein said holding elements for said supports are adapted to hold said supports in a substantially vertical position.

~~17~~. An apparatus for storing a plurality of supports having an array of polynucleotides thereon, said apparatus comprising:

(a) a manifold comprising two compartments, each of said compartments being in fluid communication with at least two gas inlets,

(b) a perforated element in fluid communication with said manifold, said perforated element comprising about 5 to about 200 perforations per square inch,

(c) a holding chamber for said supports in fluid communication with said outlet element, said outlet element and said holding chamber being disposed such that gas flow therethrough is substantially unidirectional, said holding chamber comprising an opening sufficient to permit movement of said supports to and from said holding chamber and comprising a plurality of holding elements for holding said supports wherein said holding elements are adapted to hold said supports in a substantially vertical position, and

(d) a mechanism for moving said supports into and out of said holding chamber through said opening and for positioning said supports in said holding elements.

18. An apparatus according to Claim 17 wherein said perforated element is about 0.2 to about 2 inches thick and the diameter of each of said perforations is about 0.03 to about 0.25 inches.

19. An apparatus according to Claim 17 wherein said perforated element is 0.02 to about 0.2 inches thick and said apparatus comprises a honeycomb element in fluid communication with said perforated element wherein the thickness of said honeycomb element is about 1 to about 1.5 inches and wherein the ratio of length of said honeycomb element to honeycomb features is at least about 7 to 1.

20. An apparatus according to Claim 17 further comprising a controller for controlling the movement of said mechanism for moving said supports.

21. An apparatus according to Claim 20 wherein said mechanism is a robotic arm.

22. A method for storing a plurality of supports having a plurality of biopolymers bound thereto at individual sites thereon, said method comprising:

(a) introducing a gas into a holding chamber wherein said gas has a positive and substantially unidirectional flow through and out of said chamber and

(b) placing said supports into said chamber so that the plane of said supports is substantially parallel to the direction of said unidirectional flow of gas.

23. A method according to Claim 22 wherein said gas is introduced into said holding chamber through a mechanism that forms a spatially uniform pressure field of said gas.

24. A method according to Claim 22 wherein said gas is introduced into at least two compartments of a manifold wherein each of said compartments is in fluid communication with a gas inlet, which introduces said gas into said compartments at a direction that is substantially normal to the direction of said gas exiting said compartments.

25. A method according to Claim 24 wherein said manifold is in fluid communication with an outlet element having a plurality of openings through which

said gas passes into said reaction chamber, said outlet element comprising about 5 to about 200 openings per square inch.

26. An method according to Claim 25 wherein said outlet element is about 0.2 to about 2 inches thick and comprises about 10 to about 50 openings per square inch.

27. An method according to Claim 25 wherein said outlet element is about 0.02 to about 0.2 inches thick and said apparatus comprises a honeycomb element in fluid communication with said perforated element wherein the thickness of said honeycomb element is about 1 to about 1.5 inches and wherein the ratio of length of said honeycomb element to honeycomb features is at least about 7 to 1,

28. A method according to Claim 22 wherein said gas is selected from the group consisting of nitrogen, argon, neon and helium.

~~29~~. A method for synthesizing a plurality of biopolymers on a support, said method comprising:

(a) bringing said support and a dispensing system for dispensing reagents for the synthesis of said biopolymers into a dispensing position relative to said activated discrete sites on said surface,

(b) dispensing said reagents to said discrete sites,

(c) removing said support and/or said dispensing system from said relative dispensing position, and

(d) optionally repeating steps (a) through (c) until said biopolymer is formed, wherein during said synthesis said support is stored in a holding chamber having a gas flowing therethrough in a positive and substantially unidirectional flow wherein the support is oriented in said holding chamber so that the plane of said support is substantially parallel to the direction of said unidirectional flow of gas.

30. A method according to Claim 29 wherein said gas is introduced into said holding chamber through a mechanism that forms a spatially uniform pressure field of said gas.

31. A method according to Claim 29 wherein said gas is introduced into at least two compartments of a manifold wherein each of said compartments is in fluid communication with a gas inlet, which introduces said gas into said compartments at a direction that is substantially normal to the direction of said gas exiting said compartments.

32. A method according to Claim 31 wherein said manifold is in fluid communication with an outlet element having a plurality of openings through which said gas passes into said chamber, said outlet element comprising about 5 to about 200 openings per square inch.

33. A method according to Claim 31 wherein said manifold is in fluid communication with an outlet element having a plurality of openings through which said gas passes, said outlet element comprising about 5 to about 200 openings per square inch, said element being in fluid communication with a honeycomb element through which said gas passes into said chamber wherein the thickness of said honeycomb element is about 1 to about 1.5 inches and wherein the ratio of length of said honeycomb element to honeycomb features is at least about 7 to 1.

34. A method according to Claim 29 wherein said gas is selected from the group consisting of nitrogen, argon, neon and helium.

35. A method according to Claim 29 wherein said reagents are monomer addition reagents.

36. A method according to Claim 29 wherein an array of said biopolymers is synthesized on said support.

37. A method according to Claim 29 wherein said biopolymers are polynucleotides or polypeptides.

38. A method according to Claim 29 wherein said biopolymers are synthesized on said surface in multiple arrays and said support is subsequently diced into individual arrays of biopolymers on a support.

39. A method according to Claim 29 for synthesizing an array of biopolymers on a surface of a support, said method comprising adding one or more polymer subunits at each of multiple feature locations on said support during each of multiple rounds of subunit additions wherein each round of subunit additions comprises:

(a) introducing said support into said reaction chamber,

(b) bringing said support and a dispensing system for dispensing said polymer subunits for the synthesis of said biopolymers into a dispensing position relative to said activated discrete sites on said surface,

(c) dispensing said polymer subunits to said discrete sites, and

(d) removing said support and/or said dispensing system from said relative dispensing position.

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